Extra exercises 9: Transactions and Concurrency Control

Question 1: A DBMS ensures consistency by not committing transactions that violate integrity constraints.

Question 2: A transaction that began (sent BEGIN) at 7:00PM always takes effect in the database *before* a transaction that began at 7:05PM.

Question 3: With Write Ahead Logging (WAL), a committed transaction has all its log records written to disk in the WAL log, but may not be in the storage.

Question 4: If schedule A is equivalent to schedule B, and schedule B is *not* serializable, then neither is schedule A.

Question 5: Select the correct answer about Strict 2PL.

- A) When a transaction is holding an S lock: other transactions **can** obtain an S lock.
- B) When a transaction is holding an X lock: other transactions **cannot** obtain an S lock.
- C) When a transaction is holding an S lock: other transactions **cannot** obtain an X lock.
- D) When a transaction is holding an X lock: other transactions **can** obtain an X lock.

Question 6: Given the following transactions

$$T_1 : R_1(A), R_1(B), C = A + B, A = B, B = C, W_1(A), W_1(B)$$

$$T_2 : R_2(A), A = A \times 2, R_2(B), W_2(A), B = A, W_2(B)$$

Pick the schedule that is *not* conflict equivalent to the others.

A.

T_1	T_2
$R_1(A)$	
$R_1(B)$	
	$R_2(A)$
$W_1(A)$	
	$R_2(B)$
	$W_2(A)$
	$W_2(B)$
$W_1(B)$	

B.

T_1	T_2
$R_1(A)$	
	$R_2(A)$
	$R_2(B)$
$R_1(B)$	
$W_1(A)$	
	$W_2(A)$
	$W_2(B)$
$W_1(B)$	

C.

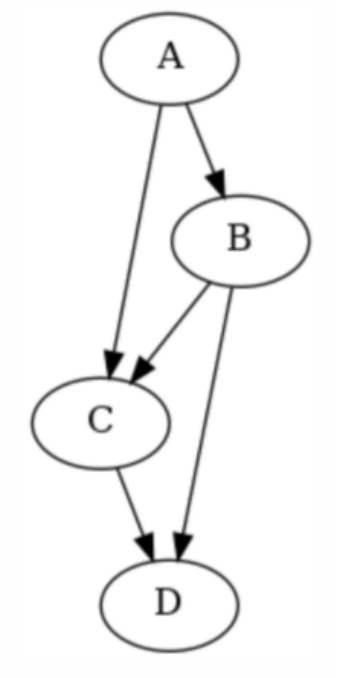
T_1	T_2
$R_1(A)$	
	$R_2(A)$
$R_1(B)$	
$W_1(A)$	
	$R_2(B)$
	$W_2(A)$
	$W_2(B)$
$W_1(B)$	

D.

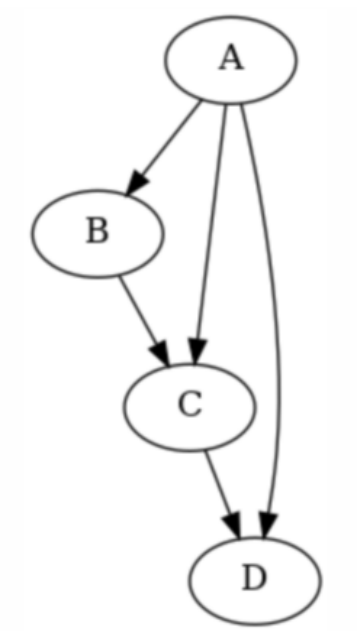
T_1	T_2
	$R_2(A)$
$R_1(A)$	
$R_1(B)$	
	$R_2(B)$
	$W_2(A)$
$W_1(A)$	
	$W_2(B)$
$W_1(B)$	

Question 7: Given the following transaction graphs of schedules (A B C D are transactions), choose the ones that are conflict serializable.

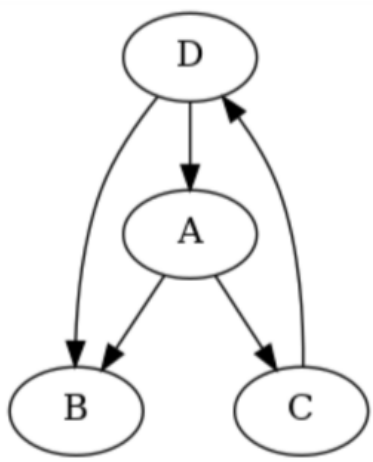
A.



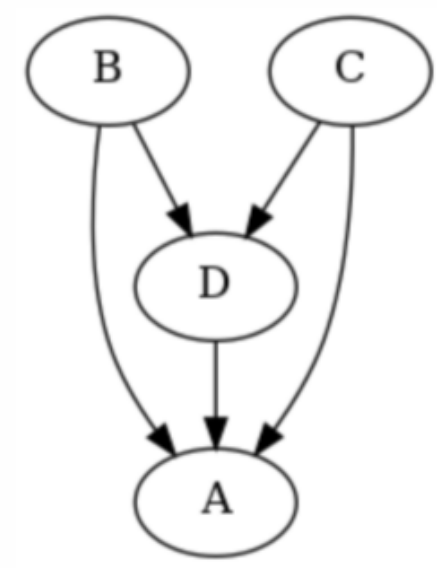
B.



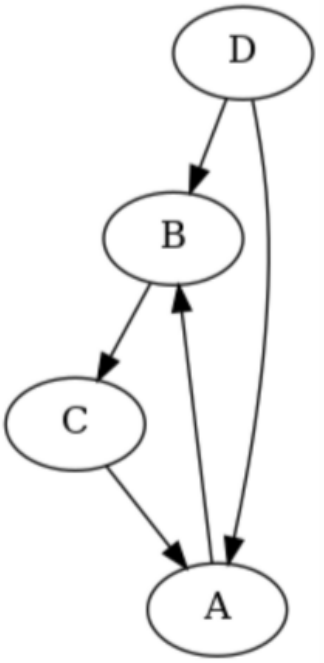
E.



C.



D.



Extra exercises 9: Transactions and Concurrency Control Solutions

Answer 1: true
Answer 2: false
Answer 3: true
Answer 4: true
Answer 5: Answer: A + B + C
Answer 6: Answer: D (writes on A happen in a different order than the rest)
Answer 7: Answer: A + B + C (there's a cycle on D + E)